Space Weather Forecast

Issued on Tuesday, 18 January 2022 at 12:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance Minor Geomagnetic Storm, mainly 20 January. Chance of isolated Moderate-class flare (R1/R2 radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low and two common class flares have been observed. The common-class flare from one of the larger sunspots on 16 January produced a CME directed mainly to the northwest of the Earth in the plane of its orbit. This may pass Earth as a glancing blow on Thursday 20 January. There are now five sunspot regions on the sun, with a couple of small unipolar groups and a further three active regions are mostly stable bipolar with the most active AR2930 approaching the northwest limb.

Solar Wind / Geomagnetic Activity: The solar wind was symptomatic of connection to a high speed stream, thought to be that emanating from a large southern solar hemisphere 'coronal hole'. The solar wind speed was elevated for much of the period. The number of particles comprising the solar wind was near average and the important northward / southwards direction remained Weak. Geomagnetic activity was Quiet to Unsettled (Kp2-3) with a Minor Geomagnetic Storm/G1 (Kp5) observed between 18/0000 UTC and 18/0300 UTC

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to stay Low. Common-class flares remain likely with a slight chance of a moderate-class flare.

Solar Wind / Geomagnetic Activity: A CME from the common-class flare from 16 January may carry an Earth-directed component, with a possible glancing blow arriving in the UTC day of Thursday 20 January. There is a slight chance of a minor geomagnetic storm for the first three days until 20 January, otherwise activity will probably remain Quiet to Unsettled. Solar winds are expected to decline from midweek (independent of the potential CME mentioned above), with increasingly quiet geomagnetic activity expected.

Energetic Particles / Solar Radiation: The weight of sunspot groups and activity in the western solar hemisphere is leading to a raised risk of S1 in the coming four-day period, although the effect is very slight.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	20	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	20	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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